

SOLIDS HANDLING

Sludge Concentration

The sludge removed from the primary clarification process and the secondary treatment process are both concentrated up to approximately 6% total solids through gravity thickeners and thickening centrifuges respectively. These thickened sludges are then sent to separate holding tanks.

Anaerobic Digestion

The thickened sludge is then blended and fed to an anaerobic digester system. The organic material in the sludge is stabilized and converted to methane gas, carbon dioxide and water over a period of 20 -25 days. Once stabilized, this sludge is then sent to dewatering for further processing. The “**bio-gas**” generated from this process is used to provide fuel for processing and heating boilers as well as auxiliary fuel for the incineration process.

Dewatering

The digested sludge and any excess waste activated sludge is dewatered in centrifuges, producing a final product with 25-30% solids. This material is then sent to either incineration or composting. Digested sludge can also be thickened up to approximately 10% solids and then sent to land application holding tanks.

Incineration and Composting

The solids from the dewatering operation are either incinerated, used as fertilizer on farm fields through land application or sent to the City of Columbus Compost Facility to make a popular gardening product called Com-Til. The product is available to the public - call 645-3153 for more information.

FOR MORE INFORMATION

Jackson Pike Wastewater Treatment Plant
2104 Jackson Pike
Columbus, OH 43223
(614) 645-3138
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www.sewers.columbus.gov

Tours are provided to the public at no charge
by appointment only.



Jackson Pike Outfall on the Scioto River

JACKSON PIKE WASTEWATER TREATMENT PLANT PROCESSES



City of Columbus
Department of Public Utilities
Division of Sewerage and Drainage



Michael B. Coleman,
Mayor

The Jackson Pike Wastewater Treatment Plant (WWTP) was built in 1935 and is the older of the two treatment facilities serving the Columbus metropolitan area. The plant removes pollutants from the wastewater through physical and biological processes prior to discharging clean water into the Scioto River. At the discharge point, the Scioto has been designated a “warm water habitat” by the Ohio Environmental Protection Agency. The City of Columbus maintains a National Pollutant Discharge Elimination System (NPDES) permit from the Ohio EPA to ensure compliance with clean water regulations.

The Columbus wastewater collection system consists of 2,782 miles of sanitary sewers and 167 miles of combined sewers that collect domestic and industrial wastewater and rainwater from the combined system. Most of the combined system is tributary to the Jackson Pike WWTP, which serves the north-western and western half of Franklin County. The second treatment facility, Southerly WWTP, treats flow from the north-eastern and eastern sections of Franklin County. In addition to the sanitary and combined sewers, there are 2,537 miles of storm sewers which discharge stormwater untreated to creeks and rivers.

The Jackson Pike WWTP has a design capacity of 68 million gallons per day (MGD) with a peak treatment capacity of approximately 102 MGD. Average daily flow for 2005 was 79.5 MGD.

The treatment process consists of two categories:

- Wet Stream
- Solids Handling

WET STREAM

Preliminary Treatment

Preliminary treatment consists of screening out large objects from the incoming wastewater, or wet stream. Next, sand and grit are removed by slowing the velocity of the wastewater and allowing those to settle. The grit is removed from the bottom of the tank, dewatered, deposited into large dumpsters and then taken to the landfill.

Primary Treatment

The incoming wastewater is then slowed to less than one foot per minute to allow the settleable solids in the raw wastewater to sink to the bottom of a large tank to be removed for further processing. Fats and oils are skimmed off the top. The only solids remaining in the water are either suspended or dissolved. The wastewater is now called “**primary effluent.**”

Secondary Treatment

The primary effluent is then mixed with biological solids (“**activated sludge**”) from the secondary treatment process and flows by gravity into the aeration tanks. This is called “**mixed liquor.**” The mixed liquor contains a wide variety of bacteria that consume the suspended and dissolved solids in the wastewater. The aeration tanks are configured to select certain bacteria to do the work. The first stage of the aeration tank has very little free oxygen. This is called an “**anoxic selector.**” Bacteria capable of utilizing bound oxygen in the form of nitrite, nitrate or phosphate for respiration predominate in this stage. The remaining seven stages of the aeration tank is called the “**aerobic selector.**” Here, fine bubble aeration is used to mix and provide free dissolved oxygen to the bacteria for respiration.



Final Clarification

The mixed liquor enters the final clarifier tank. As the flow velocity slows, the bacteria clump together forming colonies in a process called “**flocculation.**” As the colonies increase in size, they sink to the bottom of the tank where they are removed. These biological solids are called “**activated sludge.**” Most of them are returned to the secondary treatment process. A small portion called “**waste activated sludge**” is removed and processed in the solids handling part of the plant.

Disinfection

During the summer months, we disinfect the plant effluent with Sodium Hypochlorite to remove any pathogens that might be present. To prevent a discharge of excessive chlorine to the river, we remove the Sodium Hypochlorite with Sodium Bisulfite at the end of the process and re-aerate the clean water to minimize any additional oxygen demand remaining prior to discharge.